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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/583,386	05/30/2000	L. Richard Carley	000265	1365

23464 7590 11/13/2002

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EXAMINER

KIELIN, ERIK J

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 11/13/2002

16

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/583,386

Applicant(s)

CARLEY, L. RICHARD

Examiner

Erik Kielin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 and 23 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 21 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 14.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

This action is in response to the IDS filed 16 September 2002, Paper No. 14, and to Amendment D, filed 23 September 2002, Paper No. 15.

#### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 4, 21, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by EPO 0 624 900 A2 (**Sparks**).

Regarding claim 1, **Sparks**, a reference provided by Applicant in IDS filed 16 September 2002, discloses a method of fabricating a microstructure in a sealed cavity comprising,

providing a substrate **10** (Fig. 9a);

forming a microstructure **18** composed of a structural material **18** on said substrate, said microstructure being secured to said substrate by a first layer of sacrificial material **48** (Fig. 9a);

forming a second layer of sacrificial material **48** on said microstructure (Fig. 9a);

forming a cap **50** on said second layer of sacrificial material **48**, said cap forming a sealed cavity containing said microstructure and said first and second sacrificial layers (Fig. 9b);

forming one or more holes **52** in said sealed cavity, said holes being restricted to an area of said sealed cavity not directly above said microstructure (Fig. 9c);

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introducing an oxygen plasma into said sealed cavity through said one or more holes **52**, said structural material and said sacrificial material having a high etch rate differential with respect to said etchant, such that said sacrificial material is removed (col. 10, lines 46-50); and

sealing said one or more holes in said sealed cavity (Fig. 9d).

(See associated text at col. 15, line 25 to col. 16, line 23.)

Regarding the oxygen plasma etching being performed using “a barrel etcher,” this limitation is not considered to have patentable weight because it has been held that to be entitled to weight in method claims, the recited structure limitations therein must affect the method in a manipulative sense, and not amount to the mere claiming of a use of a particular structure. *Ex parte Pfeiffer*, 1962, C.D. 408 (1961). In the instant case, the claim merely recites use of the structure. Moreover, it does not matter how the etchant is introduced so long as it is an oxygen plasma, an exemplary “non-liquid etchant,” to meet the criteria established by Applicant to meet the inventive value of eliminating a “liquid etchant.”

Regarding claims 2, 21, and 22 it is seen to be inherent in **Sparks** that the etchant does not significantly etch the structural materials therein because the structures are shown to remain after the sacrificial material is etched away. Similarly, the etchant etches the sacrificial material faster and the structural material slower and the structural material is shown to be resistant to the etchant. Moreover, if these limitations were not met by **Sparks**, then no microstructure could effectively be formed, in direct contrast to what is shown in the Figs 9a-9d.

Regarding claim 4, polyimide is a known photoresist material, so photoresist is implicitly disclosed. “[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would

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reasonably be expected to draw therefrom.” See *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968). See also *In re Lamberti*, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Sparks** in view of US 5,493,177 (**Muller et al.**).

While **Sparks** discloses that the substrate is silicon, the protective silicon nitride layer formed on the silicon substrate does not appear to be disclosed therein.

**Muller**, a reference provided by Applicant and discussed in the instant specification at page 2, discloses a method of fabricating a microstructure in a sealed cavity. As noted by Applicant in the specification on page 2, regarding the **Muller** reference, the substrate is silicon with a protective silicon nitride layer **178** is formed thereon.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to apply a protect layer of silicon nitride to the silicon substrate of **Sparks** because **Muller** teaches that it provides protection to the silicon substrate during etching of a cavity, such etching of a cavity as has also been carried out in **Sparks**.

***Response to Amendment***

The affidavit under 37 CFR 1.132 filed 23 September 2002 is insufficient to overcome the rejection of claims 1-4, 22, and 22 because Applicant has provided a reference of Sparks, as noted above, which clearly teaches that the use of oxygen plasma to etch away sacrificial materials was, in fact, disclosed by Sparks, as noted above. Moreover, a reference found by Examiner in an update search, US 6,441,451 B1 (**Ikeda et al.**), teaches the use of and oxygen plasma used to etch away sacrificial material in a sealed cavity through a single hole **190**. (See col. 6, lines 55-60 and Figs 1(a)-1(h).) Note that the etching is in a lateral direction through a narrow space.

***Response to Arguments***

5. Applicant's arguments with respect to claims 1-4, 21, and 22 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

6. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 16 September 2002 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609(B)(2)(i). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication from examiner should be directed to Erik Kielin whose telephone number is (703) 306-5980 and e-mail address is erik.kielin@uspto.gov. The examiner can normally be reached by telephone on Monday through Thursday 9:00 AM until 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached at (703) 308-4940 or by e-mail at carl.whitehead@uspto.gov. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.



EK

November 8, 2002



CARL WHITEHEAD, JR.  
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